

## Final Exam Review #1

1. For the functions  $f(x) = 2x + 6$
- $f(3) = 12$
  - $f(-1) = 4$
  - $f(z) = 2z + 6$
  - Where does  $f(x) = 0$ ?  
 $0 = 2x + 6$   
 $-3 = x$

### Solving Inequalities

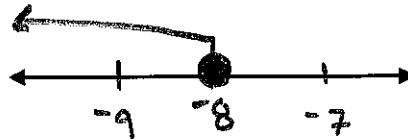
2.  $5x - 2 < 4(x + 1)$

$$x < 6$$

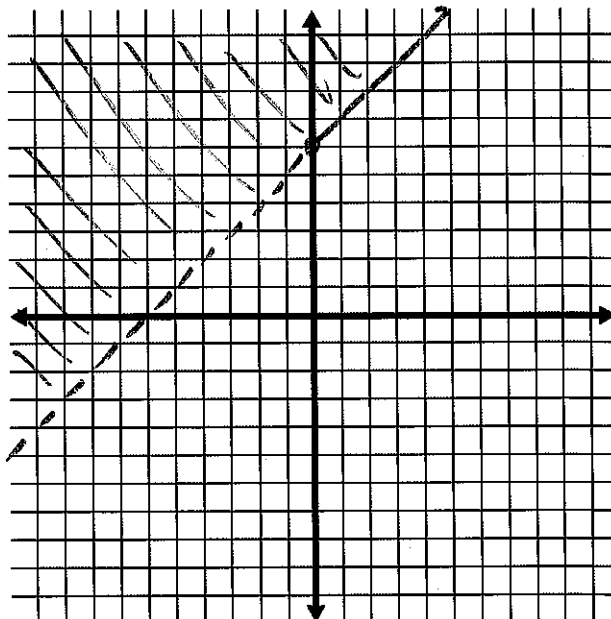


3.  $\frac{1}{2}m + 5 \leq 1$

$$m \leq -8$$



4. Graph the linear inequality.  $y > x + 6$



## Writing a function

5. What is the function rule?

$$y = \underset{\substack{\uparrow \\ \text{change} \\ \text{(add 3 each time)}}}{3}x + \underset{\substack{\nwarrow \\ \text{initial} \\ \text{value}}}{0}$$

x	y
0	0
1	3
2	6
3	9

## Linear Functions

6. Find the **slope** of the line containing the points  $(-5, 2)$  and  $(3, 6)$ .

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{-4}{-8} = \frac{1}{2}$$

7. Find the equation of the line that passes through the points  $(-2, 7)$  and  $(2, -3)$ . Graph.

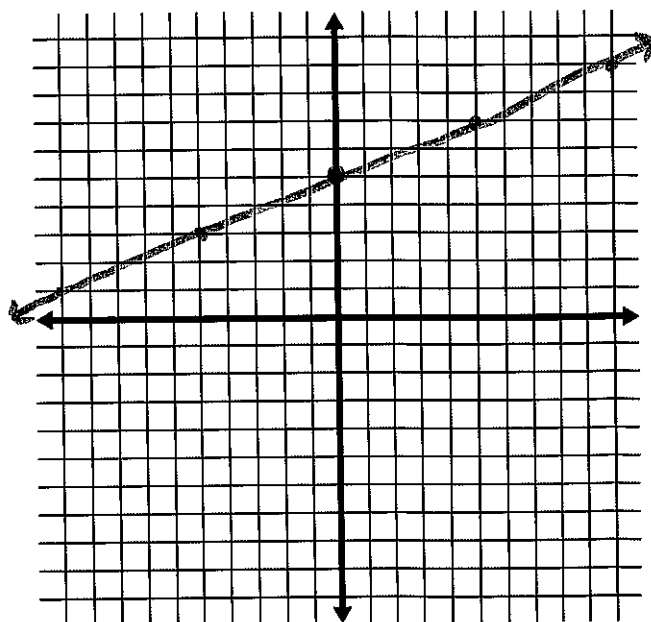
First, find slope.

$$m = \frac{10}{-4} = \frac{5}{-2}$$

Then, point slope form:

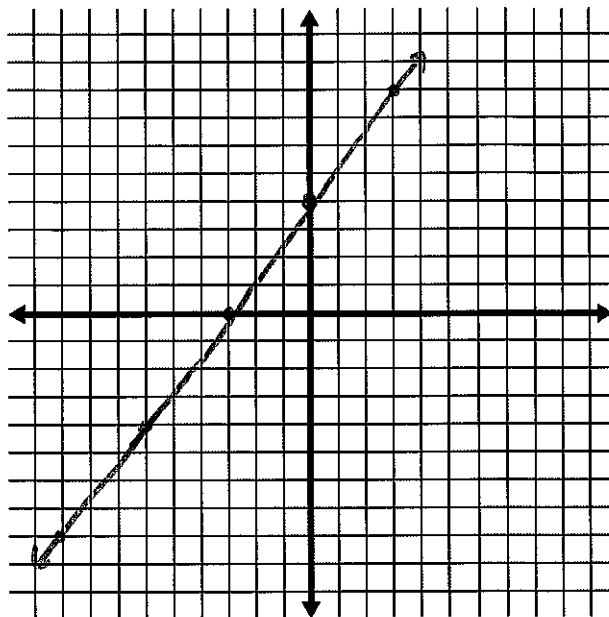
$$y - 7 = \frac{5}{-2}(x + 2)$$

8. Graph  $y = \frac{2}{5}x + 5$ .



9. Graph  $-4x + 3y = 12$ . Write the equation in slope intercept ( $y = mx+b$ ) form.

$$y = 4 + \frac{4}{3}x$$



### Systems of Equations

10. Solve the system of equations using any method you want.

$$\begin{aligned} y &= \frac{4}{3}x + 3 \\ y &= -\frac{2}{3}x - 3 \end{aligned}$$

Substitution:

$$\frac{4}{3}x + 3 = -\frac{2}{3}x - 3$$

$$x = -3$$

$$\frac{6}{3}x = -6$$

$$2x = -6$$

11. Solve the system of equations using any method you want.

$$\begin{aligned} y &= -5x - 17 \\ y &= -1 + x \end{aligned}$$

$$-5x - 17 = -1 + x$$

$$-6x = 16$$

$$x = \frac{16}{-6} = -\frac{8}{3}$$

12. Mr. Benjamin and Ms. Farrell go shopping! Ms. Farrell buys 4 shirts and 2 sweaters for \$71. Mr. Benjamin buys 2 shirts and 3 sweaters for \$66.50. How much is a shirt? How much is a sweater?

$$\begin{aligned}4s + 2w &= 71 \\2s + 3w &= 66.50\end{aligned}$$

### Exponent Rules

13. Use exponent rules to simplify  $(7xy)(3x^4y^3)$ .

$$21x^5y^4$$

14. Use exponent rules to simplify  $\frac{15x^2}{3x^{-5}}$

$$5x^7$$

### Polynomials

15. Combine:  $(-2x^4 + 14x^5 + 3x^3) + (6x^3 + 5x^5 + 7x^4)$

$$+2x^4$$

$$5x^4 + 19x^5 + 9x^3$$

16. Combine:  $(7n - 5n^4 + 11n^2) - (3n^2 + 11n^4 - 7)$

$$-16n^4 + 8n^2 + 7n + 7$$

17. Multiply:  $5n(3n + 8)$

$$15n^2 + 40n$$

18. Multiply:  $(x + 3)(6x - 5)$

$$6x^2 + 13x - 15$$

19. Factor out the GCF.  $21x^2 + 14x + 56$

$$7(3x^2 + 2x + 8)$$

## Graphing Quadratics

20. Graph the quadratic  $f(x) = x^2 + 2x - 5$

Up or down?

Up  $\cup$  positive!

Axis of Symmetry:

$$\frac{-b}{2a} = \frac{-2}{2 \cdot 1} = -1$$

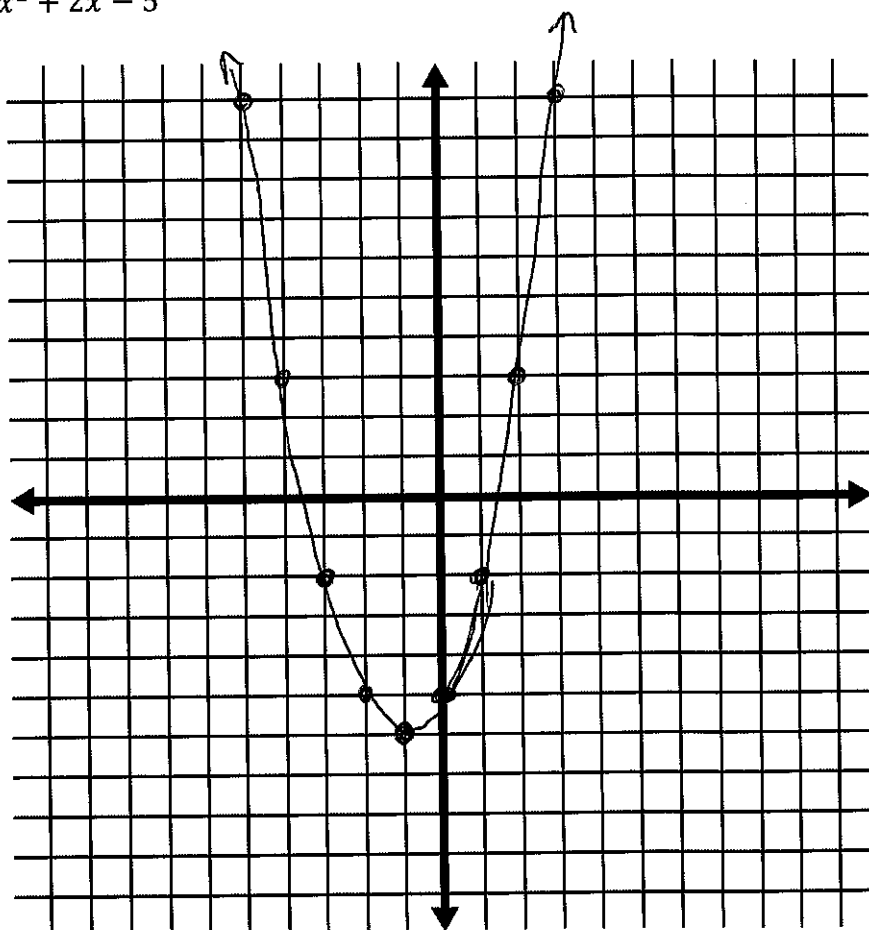
Vertex:

$$(-1)^2 + 2(-1) - 5$$

$y = -6$   
Y-intercept:  $-c$  value!

$-5$

Any other points  
(Plot at least 5 total)



## Operations with Radicals

Please simplify each into a most reduced radical expression.

21.  $\sqrt{250x^3y^5}$

$$5xy^2\sqrt{10xy}$$

22.  $\sqrt{5}(2\sqrt{10} - 3\sqrt{50})$

$$2\sqrt{50} - 3\sqrt{250}$$
$$10\sqrt{2} - 15\sqrt{10}$$

## Solving Radical Equations

Solve each equation and CHECK your solution. Please provide the solution and any extraneous solutions. If there are no extraneous solutions, write N/A or leave it blank.

23.  $\sqrt{x+7} = 2$

$$x+7=4$$

$$x=-3$$

24.  $\sqrt{5x+24} = x$

$$5x+24 = x^2 \quad \leftarrow \text{Quadratic!}$$

$= 0$  to solve!

$$0 = x^2 - 5x - 24$$

$$0 = (x-8)(x+3)$$

$$x=8 \quad \text{or} \quad x=-3$$